

PATENT SPECIFICATION

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DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Improvements in or relating to Self-Latching Electrical Coupling Connectors.

We, THE PLESSEY COMPANY LIMITED, a British Company, of 56 Vicarage Lane, Ilford, Essex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to electrical coupling connectors of the kind in which one of two complementary connector members is equipped with two resiliently deflectable stems extending towards the other connector member in the coupling direction at opposite sides of the connector members, while each stem carries at its free end a laterally projecting locking tab and co-operates with a channel provided at a corresponding place of the other connector member, the arrangement being such that when the two connector members are fully engaged, the tab of each stem co-operates with a surface adjacent to the corresponding channel to prevent withdrawal of the stem from the channel, movement of the stem into the channel during coupling and withdrawal of the stem from the channel being made possible by resilient deflection of the stem within the channel to cause the locking tab to be withdrawn into the cross-section of the channel.

It is an object of the present invention to provide an improved coupling connector of the kind specified in which the stems and channel portions are so constructed as to prevent engagement of the coupling when one of the connector members is reversed relative to the other about an axis extending in the coupling direction. For this purpose, according to the present invention, either each stem is pro-

vided with a further laterally projecting part which, when the two members are in a predetermined relative angular orientation about an axis extending in the coupling direction, is free to enter a corresponding groove or slot in the other connector member, or each stem is formed with a longitudinal groove which, when the two members are in the said relative angular orientation, matchingly co-operates with a projection of the other connector member, the further projection or the longitudinal groove of each stem being so shaped or so located in relation to the stem in question as to prevent insertion of the stem into the channel of the other connector member by which it is faced when the connector members are rotated by 180° relative to each other about such axis from said predetermined position.

A coupling connector according to one embodiment of the invention is illustrated by way of example, in the drawing accompanying the provisional specification, which is a perspective view of the two connector members aligned for locking engagement with each other, the contacts being omitted.

Referring now to the drawing, the bodies of two complementary connector members are respectively shown at 1 and 2, each substantially in the form of a rectangular parallelepiped. Each of the connector members must be assumed to be equipped with connector contacts, not shown, in such manner that when the two connector members are placed in the correct mutual coupling position, corresponding contacts of the two members are aligned for engagement with each other. The two bodies 1 and 2 shown are of oblong shape so that there is little risk of

any incorrect mutual position being mistaken for the correct position excepting that position in which one of the two members is turned by 180° relative to the other about an axis extending in the coupling direction.

The connector member 1 is further equipped with two resilient tongue-like stems 3 and 4 extending in the coupling direction from the contact face 5 of the member 1 towards the other member 2. These stems are arranged at opposite sides of the contact face 5, for example one at each of the longer sides 6 and 7 thereof, from which their inner surfaces are spaced by a small distance by means of shoulders 8. Each of the stems 3 and 4 has at its free end a shoulder portion 9 or 10 which presents an inclined lead-in surface and projects outwardly from the outer surface of the tongue 3 or 4 for a distance not greater than the width of the shoulders 8, and this shoulder portion is, for part of its width parallel to the edges 6 and 7, further extended outwardly in the direction away from the edge 6 or 7 by a tab 11 or 12 respectively.

The body 2 of the other connector member is provided at the corresponding positions of its side surfaces 13 and 14 with projecting guide portions 15, 16 and 17, 18 respectively, each pair of which co-operates to provide a guide channel 19 or 20 of a width corresponding to that of the corresponding stem 3 or 4 of the other connector member and of a depth approximately equal to, or slightly greater than, the sum of the thickness of the tongue 3 or 4 and the depth of the corresponding shoulder 8. This channel is open at the outer side by a slot 21 or 22 of a width matching the projection 11 or 12 of the corresponding stem 3 or 4 of the first-mentioned connector member 1.

According to a modification of the illustrated embodiment the outwardly projecting tabs 11, 12 and the corresponding grooves 21 and 22 may be replaced by the provision of an outwardly facing groove or slot in each stem 3 and 4 and of a corresponding inwardly projecting shoulder portion in the outer wall of the appropriate channel 19 and 20 respectively. In the illustrated embodiment the tongue-like stem 3 is made wider than the other stem 4, and its tab 11, conversely, is narrower than the tab 12 of the other stem 4. It will thus be readily appreciated that when the two connector members are moved towards each other in their correct mutual relation, the flat-section stem 3 can be introduced into the channel 19 between members 15 and 16, with the lead-in surfaces at the shoulder 9 acting to bend the stem 3 resiliently by the width of the shoulder 9, and the other stem 4 will similarly co-operate with the channel 20, and that when the connector members are fully coupled at the end of the approach movement, the shoulders

9 and 10 of the stems 3 and 4 will move outwardly, due to the resilience of the stems, thereby preventing accidental withdrawal movement of the two connector members away from each other. On the other hand such withdrawal movement, when desired, is readily made possible by applying manual pressure to the outer surfaces of the projections 11 and 12 to deflect the stems 3 and 4 sufficiently for the shoulder 9 and 10 to be accommodated in the channels 19 and 20 respectively.

It will also be appreciated that if an attempt is made to couple the two connector members in a position turned from their correct relationship by 180° about an axis extending in the coupling direction, the tab 12 of the stem 4, being wider than the groove 21, will abut the guide portions 15 and 16, and the stem 3, being of greater width than the channel 20, will abut the guide portions 17 and 18, thus preventing the connector members from movement into coupling engagement with each other.

The embodiment illustrated and described may be variously modified without exceeding the scope of the present invention. Thus instead of employing tabs 11 and 12 or grooves of different widths, tabs or grooves of equal width may be employed but differently displaced from the middle of the cross-section of each stem 3 and 4, in which case the stems themselves both have the same cross-sectional profile.

WHAT WE CLAIM IS:—

1. An electrical coupling connector of the kind specified, wherein either each stem is provided with a further laterally projecting part which, when the two members are in a predetermined relative angular orientation about an axis extending in the coupling direction, is free to enter a corresponding groove or slot in the other connector member, or each stem is formed with a longitudinal groove which, when the two members are in the said relative angular orientation, matchingly co-operates with a projection of the other connector member, the further projection or the longitudinal groove of each stem being so shaped or so located in relation to the stem in question as to prevent insertion of the stem into the channel of the other connector member by which it is faced when the connector members are rotated by 180° relative to each other about such axis from said predetermined position.

2. An electrical coupling connector, substantially as described with reference to the drawing accompanying the provisional specification.

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PROVISIONAL SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*